

Air Force Institute of Technology

Integrity - Service - Excellence

The Air Force Center for Systems Engineering

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www.afit.edu/cse



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Outline

- **Mission**
- **Organization**
- **Practitioner Support**
- **SE Education**
- **Research Projects**
- **Case Studies**



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Mission & Services

■ Mission

- Influence and Institutionalize Systems Engineering**
- Educate the workforce**

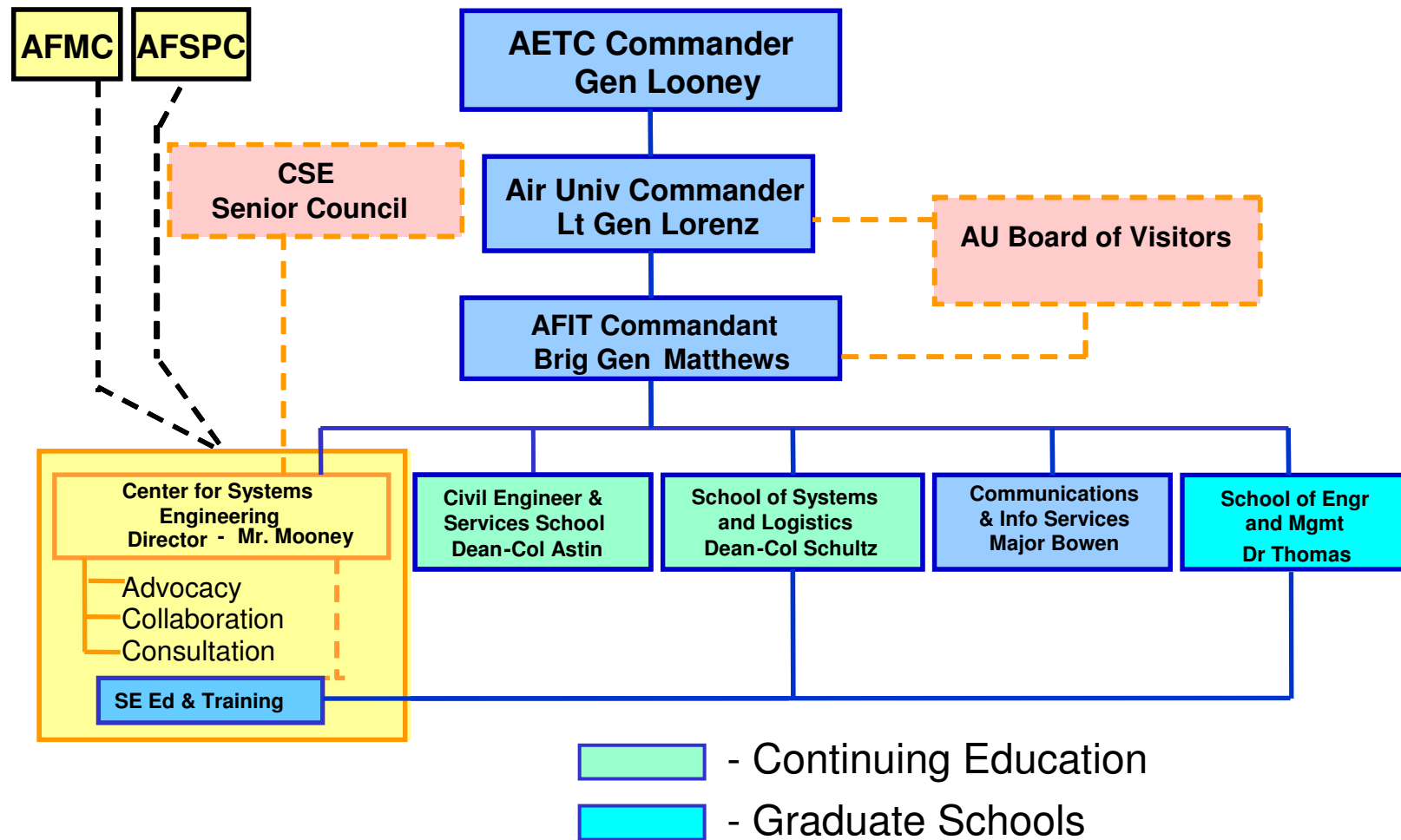
■ Services

- Vectors to the latest Systems Engineering Policy and Guidance**
- Seminars, workshops, remote and local SE continuing education and graduate education (Masters and Certificate programs)**
- Provide hands-on experience to government and industry engineers via the Rotational Systems Engineering Development program**
- Advocate the best SE practices to the AF, DoD and industry counterparts**
- Collaborate with leading SE minds to help further develop SE policy and guidance**
- Provide SE consultation services**



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Organization



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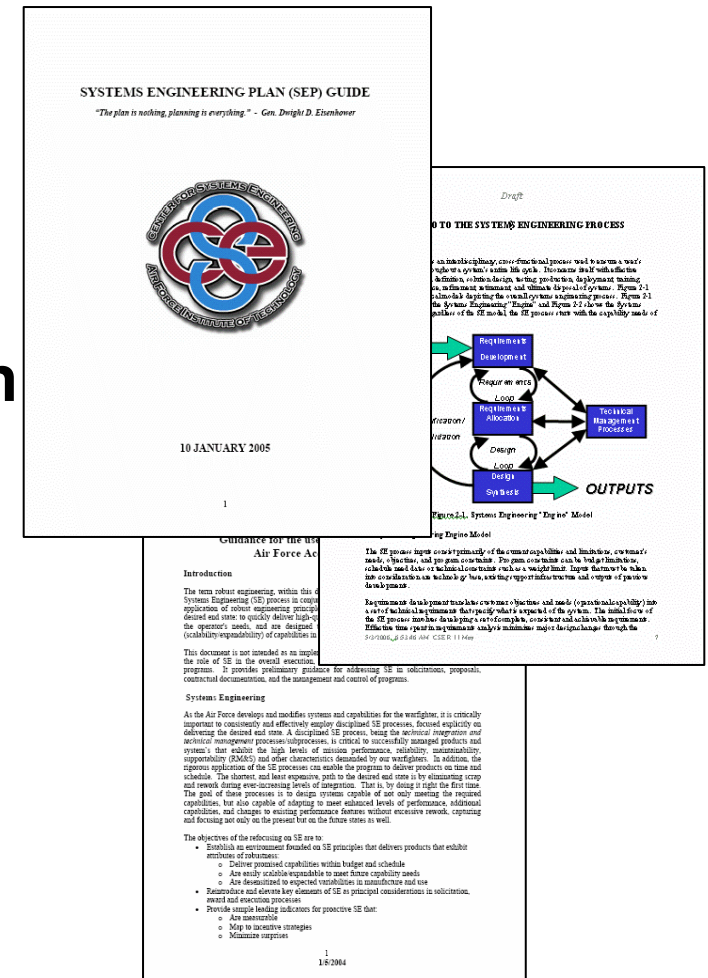


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Policy and Consulting

- Advice and consulting
 - Links to current policy
 - Plan reviews

- Policy advocacy and formulation
 - Implementation assistance
 - Guidance and policy creation
 - Guide for use of Robust Engineering in AF Acq Programs
 - AFMC SE Guide
 - SEP creation guide





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Rotational Engineer Program

- **Tailorable immersion experience**
 - **Case study development**
 - **SE Education**
 - **Refinement of tools, processes, practices**
 - **Systems engineering projects in program offices**
 - **Mentorship by experienced systems engineers**

- **Open to engineers and other functional professionals**
- **Available to government, academia, and industry personnel**



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Education and Training Division

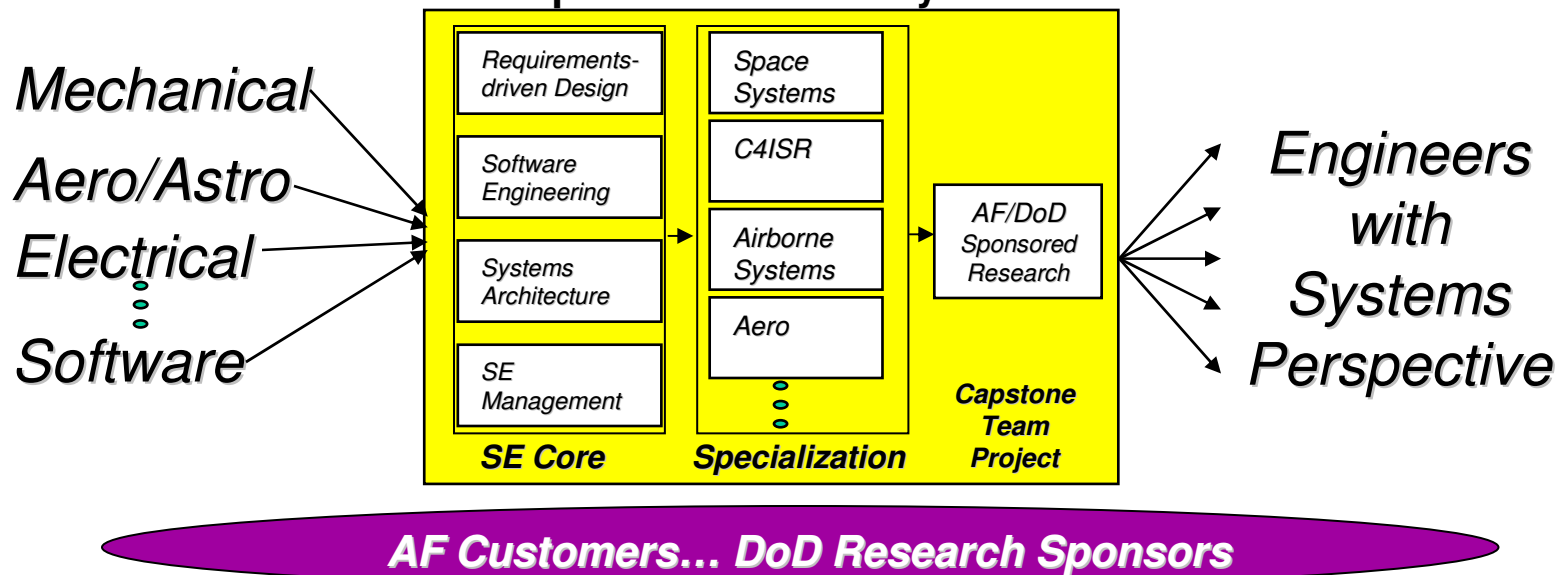
■ Graduate Program

■ Masters and Doctoral Degrees (Resident)

- Targeted toward junior officers and civilians in acquisition & engineering – 18 months

■ IDE Masters

- Broader in scope to include many career fields – 12 months



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Graduate Certificate Program

■ **Target Audience**

- Individuals with an MS degree in any science and engineering field or unable to commit to full MS timeline

■ **Curriculum**

- Four core courses & capstone project – part-time 12-15 months
- Currently available
 - Distance Learning at Kirtland, LA, Peterson AFBs
 - Resident/DL at Wright Patterson AFB
- Expanding
 - Hill AFB and Tinker AFB – Fall 2006
 - Vision – anywhere
- Awarding 20-25 certificates/year

■ **Collaborative Education Agreements**

- Apply certificate courses towards local Masters degree
- University of New Mexico @ Kirtland AFB
- Loyola Marymount University @ Los Angeles AFB



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SE Continuing Education

■ Established Courses

- **Systems Architecture (SYS183/283)**
- **Systems Engineering (SYS 182/282)**
- **Air Worthiness Certification (SYS 116)**
- **Operational Safety, Suitability and Effectiveness (OSS&E) (SYS 155)**
- **Software Professional Development Program**

■ Custom Developed Courses

- **NRO – Capability Development Course (SE 602)**
- **SAF/XC – Capability Based Systems Development (SENG 540-NC/SENG 539-NC)**
- **Focus Week Topics**



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Research

- **AF and DoD-Sponsored Group Projects and Theses**
 - Relevant -- constantly soliciting topics
 - Inexpensive and responsive
- **Examples**
 - **Process Application**
 - Implementing Capability-Based Development
 - C4ISR (JBMC2) - JFCOM
 - Weapon Data Link – Eglin AAC, AFRL/MN
 - **SE Process Management**
 - Historical Analysis of Fighter Aircraft Development - AFMC
 - Case Study of Avionics Modernization Program - ASC
 - **Improved Methods for Analysis and Design of Complex System of System level Concepts**
 - Role of architectures in concept analysis
 - Appropriate metrics and models
 - Example Applications
 - Net Centric Operations – SAF/XC, SOCOM
 - Cooperative Behavior and Control – AFRL/MN

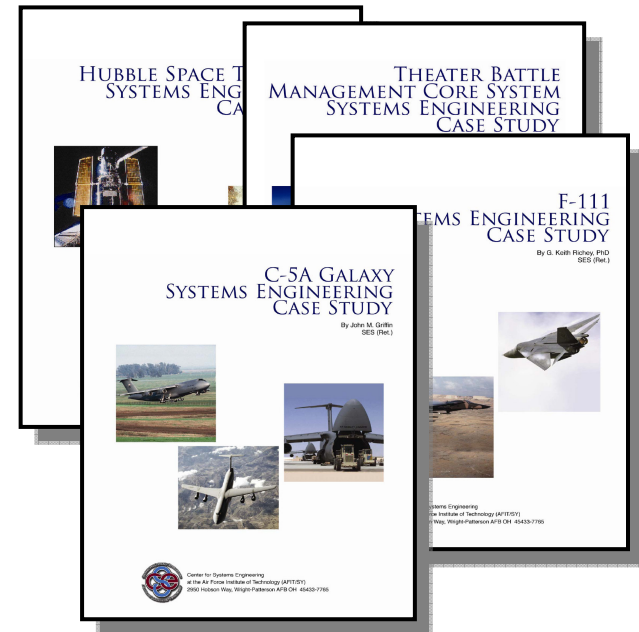




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SE Case Study Development

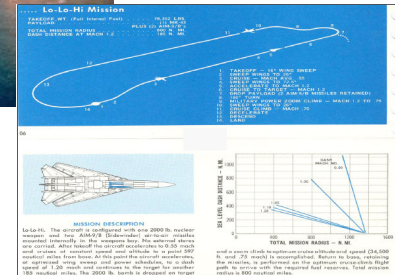
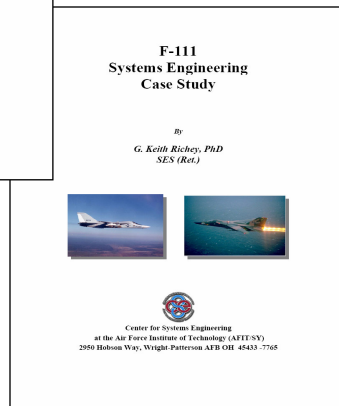
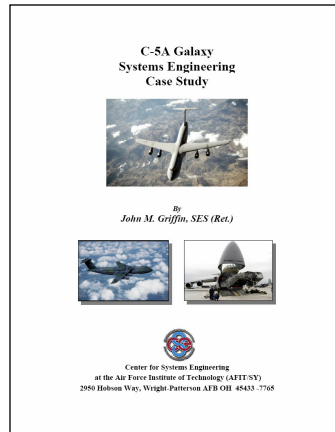
- **Purpose: Support the teaching of SE principles**
 - **Consequences of SE & programmatic decisions on cost, schedule & effectiveness**
 - **Discussion of both successful and unsuccessful methods, processes, principles, tools and decision material**
 - **Highlight the importance of skills from multiple engineering disciplines**
- **Cover all portfolio domains – airborne, space, munitions, C2 and MIS**
- **Open to suggestions for future studies**





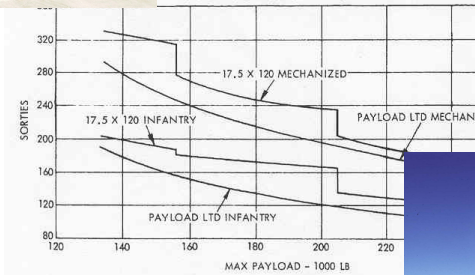
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Sample Case Study Learning Principles



Direct Program Support

OVERSIZE VEHICLES + JEEPS
MECH DIV W/O TROOPS 38.9 X 10⁶ LB
INF DIV W/O TROOPS 24.8 X 10⁶ LB



- Requirements Feasibility (F-111) > JSF
- Aircraft Weight Growth (C-5) > F/A-22, JSF
- Concurrent Development (F-111) > Global Hawk
- Total Pkg Procure Concept (C-5) > Life Cycle Cost Mgmt

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Coming Soon @ the AF CSE

- **Late Spring 2006**
 - **B-2 Case Study (in final editing)**
- **Summer 2006**
 - **JASSM Case Study (external coordination)**
- **Fall 2006**
 - **New cohort for SE Graduate Certificate Program**
 - **SE Masters degree by distance learning (in as little as 21 months)**
- **Spring 2007**
 - **Global Positioning System (GPS) and A-10 Case Studies**






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SEARCH
...our site



AIR FORCE CENTER FOR SYSTEMS ENGINEERING
"The AF One Stop Shop for Systems Engineering"


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[WHAT WE DO](#)

[WHAT WE CAN DO FOR YOU](#)

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[GSE Programs](#) | [Continuing Education](#) | [Academic Outreach Activities](#) | [Orientation Activities](#) | [Key Courses](#) | [MORE >>](#)

UPCOMING EVENTS
...More Events 

INCOSE 2006, the 16th International Symposium
7/9/06 at 12:00 PM ...[\[read more\]](#)

9th Annual NDIA Systems Engineering Conference
10/23/06 at 12:00 PM ...[\[read more\]](#)

WELCOME!
...To The Future of Systems Engineering

NOTICE: Our site address has changed. Please update your bookmarks


Welcome to the Air Force Center for Systems Engineering (CSE) web Site.

Our Center was created in Feb 2003 and we have been growing ever since. We are located

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Summary

- AF Center for Systems Engineering is **YOUR** resource for
 - Workforce education
 - Consulting
 - Policy advice
 - Research
 - Case studies



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Questions



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